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Forest Service

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Reply To: 3420

Date: SEP 08 1988

Subject: Dwarf Mistletoe in the Heart Bar Campground (Report No. 88-21)

To: Forest Supervisor, San Bernardino National Forest

On 16-17 August 1988, Plant Pathologists Melissa Marosy and Susan Frankel visited the San Gorgonio District of the San Bernardino National Forest. The primary objective of the visit was to assist the District in identifying areas that would benefit from dwarf mistletoe suppression. With the aid of John Palermo, Recreation Officer for the San Gorgonio Ranger District, Heart Bar Campground was identified as such an area.

Dwarf mistletoe was evaluated in Heart Bar in 1979, and deemed a problem serious enough to pose a threat to long-term thrift and survival of the affected trees (see report from Forest Insect and Disease Management (FIDM) to the Forest Supervisor dated December 17, 1979). A survey of the campground was subsequently conducted, and potential methods for control were presented (see letter to the Forest Supervisor dated August 8, 1980). Guidelines to assist in deciding how to treat individual trees were provided. It was advised that the dwarf mistletoe suppression operations should be coordinated with proposed campground changes or construction.

A suppression project was initiated in March 1981. Objectives of the project were to decrease incidence of dwarf mistletoe in the campground and adjacent area and to increase the vigor of both young and old growth pine, while favorably influencing the recreational character of the campground. A biological evaluation conducted by Forest Pest Management (FPM) personnel in 1987, at the request of the District, determined that the primary suppression effort in 1981 and several later small-scale entries had significantly eliminated the dwarf mistletoe infestation in most of the campground (see Report No. 87-13). Certain portions of the pre-existing campground area or the proposed expansion area were not treated, however, and harbored severe infestations. It was suggested that dwarf mistletoe suppression would best be implemented before the campground renovation was completed, and alternatives for implementation of such a project were presented.

During their recent visit, Melissa Marosy and Susan Frankel, assisted on 17 August by Ernest Del Rio, Forest Silviculturist, conducted a survey for incidence and severity of dwarf mistletoe on Jeffrey pine in the northwestern

portion of proposed Loop C of the campground. This region had been identified in 1987 as being severely infested. The results of this survey follow.

OBSERVATIONS

Approximately 150 trees of all age and size classes (excepting those less than 1 inch DBH) with some level of dwarf mistletoe infection were surveyed. Trees were rated according to the Hawksworth 6-point dwarf mistletoe rating system, and a specific treatment (pruning, removal) recommended. Trees without dwarf mistletoe infections were not recorded; however, it is estimated that approximately 50% of the trees in the area surveyed have some level of dwarf mistletoe. Of these infected trees, approximately 70% have a dwarf mistletoe rating of 1 or 2, 25% 3 or 4, and 5% 5. No tree was given a dwarf mistletoe rating of 6.

The vegetative goal set forth for this area by Ernest Del Rio in December 1987 is "to maintain a predominantly natural-appearing vegetation environment that is characterized by a mixed conifer stand where all age classes are represented and random isolated openings covered by low-lying shrubs and grasses are present". Although few trees in the surveyed area are seriously infected, many of the infected understory trees harbor bole infections or infections high in the crown, where the infection will have the greatest effect on tree vigor. Chronic annual mortality in the stand can be expected as the dwarf mistletoe in these trees intensifies. Increased levels of mortality can be anticipated after drought years, such as we are currently experiencing, due to additional stress to the trees. Spread of the parasite to uninfested trees both within and beyond currently affected areas of the campground can be expected to continue. Thus, without dwarf mistletoe suppression efforts, long-term maintenance of a natural-appearing uneven-aged stand may not be possible.

SUMMARY

Because of the high recreational value of the Heart Bar Campground, a dwarf mistletoe suppression project in this area is warranted to increase the health and vigor of the existing stand and thereby maintain a desirable recreation environment. Since the campground is currently undergoing renovation, the current time would be ideal for such a project. Ernest Del Rio and John Palermo are in agreement that dwarf mistletoe control efforts are needed and desired at this time in Heart Bar Campground, and both are willing to work with FPM to implement and complete a successful dwarf mistletoe suppression project in this area. Sufficient suppression funds are expected to be available from FPM for FY 89 to implement such a project (available for use October 1).

At the present time, we suggest consideration of the following alternatives:

(1) Remove all trees with a dwarf mistletoe rating of 5 or 6, and prune witches brooms from trees with lower ratings. This option would involve removing about 5% of the trees in the most severely affected areas (see Observations), and would reduce stress to those trees with brooms. It would maintain the current character of both the overstory and understory.

This option would not curtail intensification of the parasite within currently
infested trees, nor would it significantly reduce spread of the parasite to uninfested trees within or beyond currently affected areas.

(2) Remove or prune affected trees according to the guidelines listed in the enclosed document, "Dwarf Mistletoe Control in Recreation Areas". This option would entail the removal of a number of trees in some heavily infested areas (38% of infected trees in the surveyed area), and pruning of remaining affected trees. It would increase vigor in the remaining trees and significantly reduce the potential for spread of the parasite. It would ensure an uninfested understory to eventually replace current overstory trees which have succumbed or will succumb to dwarf mistletoe or other factors. It would create small openings which may be allowed to revegetate naturally or be planted to species not susceptible to the parasite. The overall effect of implementing this option would be entirely consistent with the vegetative management goal set forth for this area.

To pursue dwarf mistletoe suppression in the Heart Bar Campground, the following must be submitted by the District to FPM for approval:

1. a project proposal, Form FS-3400-2.
2. an environmental assessment that includes project objectives, a copy of this evaluation, a project work plan, a benefit-cost analysis, and a post-suppression evaluation plan.

At your request, the FPM Staff is available to provide whatever assistance or additional information they can for satisfying these requirements, including preparation of a project proposal, training of survey crews, and developing plans for post-suppression evaluations.

If there are any questions, please contact Melissa Marosy (415-556-6940).

for John Kilgunas

JOHN NEISESS, FPM Program Leader
State and Private Foresty

Enclosures

DWARF MISTLETOE CONTROL IN RECREATION AREAS

Forest Pest Management

The progressive effects of dwarf mistletoe on trees are not dramatic or immediately obvious to the casual observer but take place over a long period of time. Control projects, therefore, are investments in the future health of campground trees, and we encourage land managers to consider the benefits of treatment. Thorough and aggressive projects can be very successful in reducing mortality and infection levels while increasing tree vigor and longevity.

Control alternatives

Dwarf mistletoe treatments may include one or any combination of the following:

1. Removing infected overstory trees to protect regeneration.
2. Removing witches' brooms to prolong tree life.
3. Removing all infections by pruning to eliminate the parasite.
4. Removing heavily infected trees that cannot be successfully pruned.
5. Thinning to remove infected trees and release residual trees.
6. Destroying heavily infected stands or aggregations and then regenerating.
7. Creating buffer strips to prevent re-entry of dwarf mistletoe.
8. Favoring resistant species (includes planting).

Estimated effects of dwarf mistletoes

Field observations and studies involving ponderosa and Jeffrey pines in California, Nevada and Arizona recreation areas have produced several generalizations to help estimate the future effects of dwarf mistletoe on individual trees and the expected benefits of treatment. Pines with dwarf mistletoe ratings of 1 through 4 will normally advance to the next higher class in about 10 years. Trees with ratings of 5 or 6 will probably die within 10 to 15 years and are prime targets for insect attack. Removal of all mistletoe infections (within the limits described below) should allow a tree to reach normal maturity, and removal of just witches' brooms from moderately infected trees may increase its life by 10 to 20 years.

Control procedures and guidelines

The first step in control project for campgrounds is to map the areas of infestation. Then each infected tree and the area around it must be examined to decide whether to remove the mistletoe or to remove the entire tree. The

enclosed Dwarf Mistletoe Survey Data Sheet (page 4) may be used to help determine individual tree treatments and to estimate project costs. In making these decisions and planning a project the guidelines below should be used. High-value trees and special situations may require deviation from these generalizations. However, deviations should be kept to a minimum in order to maintain treatment effectiveness.

1a. Trees with a dwarf mistletoe rating (DMR) of 3 or less - prune off all lower branches, both healthy and diseased, at the bole up to and including the second whorl of branches above the highest visible mistletoe infection. Experience has shown that removing branches only up to the highest infection or even one more whorl almost certainly results in latent infections appearing in 3-5 years.

b. Trees with a DMR or 4, and no mistletoe in the upper 1/3 of crown - prune to remove infections or take tree out depending on the condition of crown, tree vigor, distribution of mistletoe and importance of tree.

c. Trees with a DMR of 5 or 6 - remove; in special situations these may be broom pruned.

2. A tree should have at least 30% live crown after pruning.

3. Whenever possible avoid removing more than 50% of a tree's live crown.

4. Bole infections - if the stem diameter at the point of infection is less than 6 inches, remove the tree. Bole infections are not serious from the standpoint of spreading mistletoe, but they deform and/or lead to mortality of small trees and failure of large trees.

5. Branches 1 inch or less in diameter with mistletoe plants within 6 inches of the bole are not prunable because the parasite is probably already in the bole. For each 1-inch increase in branch diameter, the minimum safe distance for pruning increases 2 inches. For example, the minimum safe pruning distance from the bole to mistletoe plants for branches 1 to 2 inches in diameter in 8 inches.

6. Removing witches' brooms from high-value trees will increase the vigor and longevity of those trees. It may not be possible or acceptable to remove all remaining branch infections, and this means that a source of mistletoe seed is still in the crown.

7. Some infections may be left in desirable isolated trees where there are no susceptible trees within range of remaining mistletoe shoots/seeds. This is often the case when broom pruning is used.

8. In very dense aggregations it is often best to thin out infected trees even though they are prunable. Make decisions based on tree vigor, spacing, and expected response of residual trees.

9. Buffer zones, defined as areas free of susceptible hosts, are essential to prevent mistletoe from re-entering the control area. Examples include meadows, roads, rivers, clearings and plantations of non-host trees. Construction of new roads, structures or campsites can also be used to create buffer zones.

10. Green pine slash generated by pruning or tree removal should be treated to reduce the risk of pine engraver (Ips spp.) buildup. Slash created in the spring or early summer should be lopped and scattered, piled and burned while green, chipped, or removed from the site.

11. Treat all freshly cut stump surfaces with borax to prevent the establishment of Fomes annosus root disease.

12. Definitely plan to re-enter and treat the campgrounds in 3 to 5 years to remove previously undetected latent infections. Dwarf mistletoe can seldom be eliminated with one entry.

13. A post-suppression evaluation is essential to monitor project effectiveness and thoroughness. This evaluation should be designed before ground work is begun and completed soon after treatment is finished. Completing the Dwarf Mistletoe Survey Data Sheet can help document treatment effectiveness.

FOREST PEST MANAGEMENT SUPPRESSION FUNDS

FPM expects to have dwarf mistletoe control funds for the current fiscal year. If the District decides to request suppression dollars, the following must be submitted to FPM for approval:

- a project proposal, Form FS-3400-2;

- an environmental assessment that includes project objectives, a copy of this evalutation, a project work plan, an analysis of economic efficiency (FSM 1970 and 3433) and a post-suppression evaluation plan.

At your request, the FPM Staff is available to provide whatever assistance or additional information they can for satisfying these requirements. We suggest that prior to beginning any preparation of a project proposal, our staff should meet with Forest/District personnel to go over actual dwarf mistletoe field situations and appropriate treatment strategies. In addition, plans for a post-suppression evaluations and approaches to an economic analysis can be discussed.